User Manual

ETU01
ETU01U

Single Modular Data Port
G.703 E1 Access Unit

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ETU01 (ETU01U) E1 Access Unit, User Manual
Version 3.0 September 14, 2009 (Official Release)

This manual supports the following models*:
ETU01-AC universal AC model, ETU/TTU Modular I/F

ETU01-DC universal (18~75V) DC model, ETU/TTU Modular I/F

ETU01U-AC unframed E1, universal AC model, ETU/TTU Modular I/F

ETU01U-DC unframed E1, universal (18~75V) DC model, ETU/TTU Modular I/F

* For Version 3 models (45x195x155mm HxWxD) with version 1.2 PCB

For legacy models, please download the old manual from CTC Union's website or contact our customer service.

Chapter 1 Introduction

1.0 Welcome

Thank you for selecting the ETU01 for your E1 service termination. We hope you find this device in perfect working order and that it provides many years of reliable service.

1.1 Product Description

The ETU01 is a single modular port access unit for E1 or Fractional E1 service. The ETU01U is a single modular serial port access unit for Unframed E1 only. The ETU01 AC model has a universal, auto-switching power supply (90~250VAC) while the DC model's internal regulator module accepts DC voltages from 18 to 75 volts.

A number of user replaceable data modules are available in the ETU/TTU series for use in the single port ETU01, including serial modules for RS-232, V.35, RS-530/449, X.21 as well as Ethernet bridge and router modules. Additionally, legacy modules are available for hard to find interfaces such as G.703 64K Codirectional and NRZ. Please refer to the appendix for complete descriptions of the available interface options.

1.2 Technical Specifications

E1 link

Framing	-Unframed (ETU01U only Unframed) -CCS (PCM31)/CAS (PCM30) -CRC4 ON/OFF
Bit Rate	2.048 Mbps
Line Code	-AMI -HDB3
Line Impedance	-75 ohms -120 ohms
Relative Receive Level	0 to -43dB
"Pulse" Amplitude	-Nominal 2.37V±10% for 75 ohms -Nominal 3.00V±10% for 120 ohms
"Zero" Amplitude	±0.1V
Transmit Frequency Tracking	
Internal Timing	±30 ppm
Loopback Timing	±50 ppm
External Timing	±100 ppm
Jitter Performance	According to ITU-T G.823
Complies With	ITU-T G.703, G.704, G.706 and G.732
Interface Connectors	-BNC (unbalanced) -RJ-45 (balanced) per USOC RJ-48C

User Data Channel	
Modular Interfaces	-V.35
	-RS-530
	-RS-449 (RS-530 Plus cable)
	-X.21
	-RS-232
	-G64K codirectional
	-NRZ
	-ET100 Bridge
	-ET100R Router
Interface Connectors	
V.35 Interface	34 pin, M-Block Female
RS-530	25 pin, DB25 Female
RS-449	37 pin, DB37 Female (adapter cable)
X.21	15 pin, DB15 Female
RS-232	25 pin, DB25 Female
G64 codirectional	15 pin, DB15 Female
NRZ	BNC Female x 4
ET100	RJ-45 LAN connector
ET100R	RJ-45 LAN connector
Line Code	NRZ (except Ethernet and G64)
	HDB3 (G64 codirectional)
	NRZI plus 4B/5B (Ethernet)
Data Rate	N×56kbps or N×64kbps
	where N equal 1 to 31 in CCS
	and N equal 1 to 30 in CAS
	2.048Mbps Unframed
Clock Modes	
Clock Mode 0 (DCE1)	Receive and transmit clock (recovered) to the synchronous DTE
Clock Mode 1 (DCE2)	Receive and transmit clock (internal oscillator) to the synchronous DTE
Clock Mode 2 (DTE1)	Receive clock to the synchronous, and transmit clock from the synchronous device
Clock Mode 3 (DTE2)	Receive and transmit clock from the synchronous DCE (from ETC and ERC pin)
Clock Mode 4 (DTE3)	Receive and transmit clock from the synchronous DCE (all from ETC pin).
Control Signals	-CTS constantly ON
	-DSR constantly ON, except during test loops
	-DCD constantly ON, except during signal loss
Time slot allocation	User defined (N.A. for Unframed)

Diagnostics

Test Switches/Diagnostics		-Digital local loop back -Analog local loop back -Digital remote loop back -Test pattern / generator

LED indicators

PWR	Green	Power
TD	Green	Transmit data
RD	Green	Receive data
RTS	Green	Request to sent
DCD	Green	Data carrier detect
Tx CLK Loss	Red	Transmit clock loss
Signal Loss	Red	E1 line signal loss
Sync Loss	Red	E1 line sync loss
Alarm	Red	E1 line alarm, include: BPV error / CRC4 error / Frame slip / All ones(AIS) / Remote alarm
Error	Red	Bit errors during integral BERT
Test	Red	Loop back and pattern test enabled

Physical

Height:	45 mm (1 3/4")
Width:	195 mm (7 5/8")
Depth:	155 mm (6 1/8")
Weight:	0.5 kg (1 lb 2 oz)

Power supply

Voltage	90~250VAC (universal AC model) 18~75VDC (universal DC model)
Frequency	47 to 63 Hz for AC
Power consumption	10 Watts

Environment

Temperature	-10°~60°C / 15°~140°F
Humidity	0 to 95% non-condensing

1.3 E1 signal structure

The E1 line operates at a nominal rate of 2.048Mbps. The data transferred over the E1 line is organized into frames, with each E1 frame containing 256 bits. The 256 bits consist of 32 time slots of eight bits each, which carry the data payload.

E1 transmission utilizes two main types of framing: Frame Alignment Signal (FAS) and Multi-Frame Alignment Signal (MFAS). Framing is necessary in order for equipment receiving the E1 signal to be able to identify and extract the individual channels. PCM-30 (CAS) transmission system use MFAS framing along with the FAS framing. PCM-31 (CCS) transmission system use only FAS framing.

Frame Alignment Signal (FAS)

The 2.048 Mbps frame consists of 32 individual time slots (numbered 0-31). As described previously, each time slot consists of an individual 64Kbps channel of data. In the FAS format, time slot 0 of every other frame is reserved for the frame alignment signal pattern. Alternate frames contain the FAS Distant Alarm indication bit and others bits reserved for national and international use.

Multi-Frame Alignment Signal (MFAS)

MFAS framing uses Channel Associated Signaling (CAS) to transmit A/B/C/D bit signaling information for each of 30 channels. This method uses the 32 time slot frame format with time slot 0 for the FAS and time slot 16 for the Multi-Frame Alignment Signal and the Channel Associated Signaling.

E1 line signal

The basic E1 line signal is coded using the Alternate Mark Inversion (AMI) or HDB3 rule.

In the AMI format, "ones" are alternately transmitted as positive and negative pulse, whereas "zeros" are transmitted as a zero voltage level. AMI is not used in most 2.048Mbps transmissions because synchronization loss occurs during long strings of data zeros."

In the HDB3 format, a string of four consecutive zeros is replaced with a substitute string of pulses containing an intentional bipolar violation. The HDB3 code substitutions provide high pulse density so that the receiving equipment is able to maintain synchronization with the received signal.

1.4 ETU01 Capabilities

E1 link line coding

The ETU01 and ETU01U support two E1 line codes:
AMI coding.
HDB3 coding.

E1 framing formats

The ETU01 supports three formats:
Unframed format.
FAS (CCS, PCM-31) format.
MFAS (CAS, PCM-30) format.
The ETU01U supports only unframed format.

User data channel rates

The ETU01 supports user data channel rates which are a multiple of 56 or 64kbps. For maximum flexibility, the ETU01 supports data rates up to 2.048Mbps. The ETU01 supports flexible time slot assignment, allowing the user to freely specify the selection of time slots. The ETU01U supports unframed operation with a data rate of 2.048Mbps only.

1.5 System Timing Considerations

The ETU01 has the flexibility to meet the timing requirements of various system configurations. The timing mode for the E1 link and the user data channel are selected by the setting of DIP switches.

E1 link timing

The ETU01 E1 link receive path always operates on the receive clock. The ETU01 recovers the receive clock from the received E1 link data signal. The source of the ETU01 E1 link transmit clock can be selected by the user.
The following E1 link transmit timing modes are available.

Recovery (loop back) timing:

The ETU01 E1 link transmit clock is locked to the recovered receive clock. This is usually the timing mode selected for network operation.

Internal timing:

The ETU01 E1 link transmit clock is derived from the internal clock oscillator. This timing mode is necessary in point-to-point applications over leased line. In this case, one ETU01 must use the internal oscillator, and the others must operate from the recovered clock.

External timing:

The ETU01 E1 link transmit clock is locked to the clock signal provided by the user DCE connected to the data channel. When the data channel is used as the clock source, the data channel must use clock timing mode 3 (DTE2) or 4 (DTE3).

The ETU01 can select from one of five clocking mode settings.

Clock mode 0 (DCE 1):

The ETU01 data channel operates as a DCE and provides both transmit and receive clocks (recovered timing) to the data terminal equipment connected to the user channel. The clocks are locked to the recovered E1 timing.

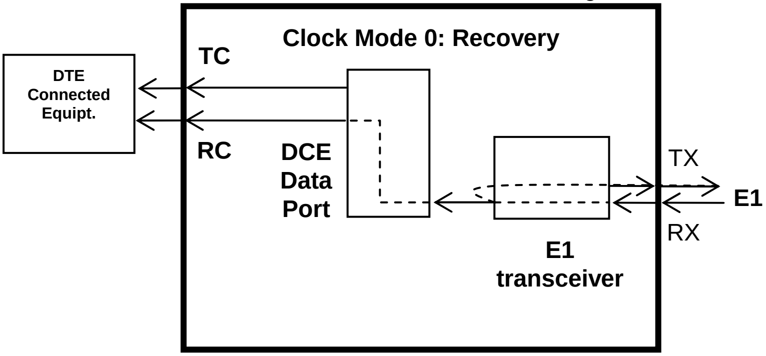


Figure 1.1 Recovery timing

Clock mode 1 (DCE 2):

The ETU01 data channel operates as a DCE and provides both transmit and receive clocks (internal oscillator timing) to the data terminal equipment connected to the user channel. The clocks are locked to the oscillator timing.

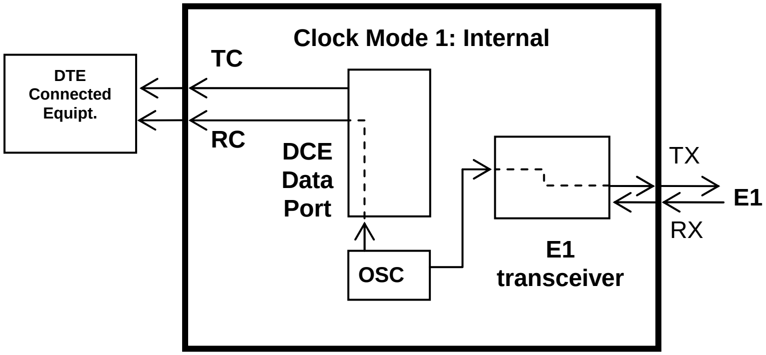


Figure 1.2 Internal Timing

The internal oscillator provides the clocking source for both the user data receive timing out the RC and TC pins and the E1 transmit timing.

Clock mode 2 (DTE 1):

In the transparent clocking mode, the ETU01 data channel supplies the receive clock to the synchronous DCE, and accepts a transmit clock from the DCE (from the ETC pin). The DCE must transmit data at the rate of the clock signal supplied by the ETU01.

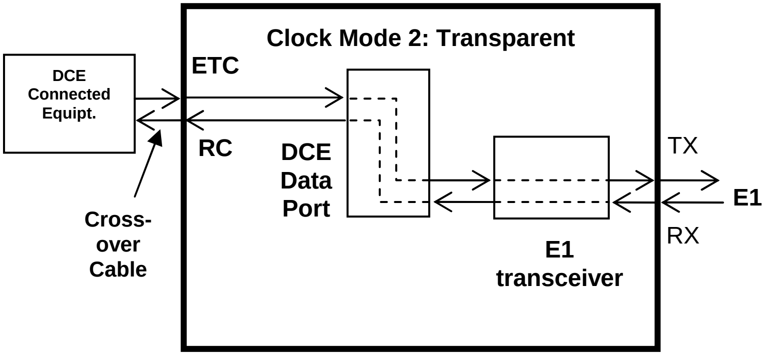


Figure 1.3 Transparent Timing

The E1 receive clock provides the clocking source for the user data receive timing out the RC pin. The user data transmit timing is input from the ETC pin and provides the clock for the E1 transmit link.

Clock mode 3 (DTE 2):

The ETU01 data channel is physically wired as DCE. However, the ETU01 may operate as a DTE when connected to other DCE equipment by using a cross-over data cable and by setting the clock mode to the DTE2 setting. NOTE: The X.21 data channel cannot be operated in clock timing mode 3 (DTE2).

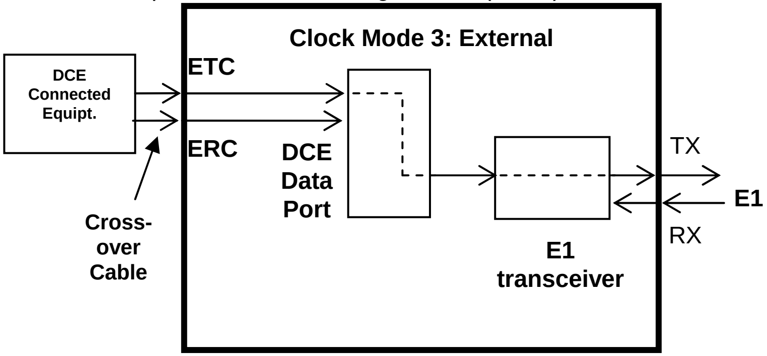


Figure 1.4 External Timing

The clock input from the ERC pin provides clocking source for the receive timing, while clock input from the ETC pin provides the clocking source for the user data transmit timing and the E1 transmit link.

Clock mode 4 (DTE 3):

The ETU01 data channel is physically wired as DCE (classed as communication equipment). However, the ETU01 may operate as a DTE when connected to other DCE equipment by using a cross-over data cable and by setting the clock mode to the DTE3 setting. The ETU01 data channel then operates as a DTE and accepts both transmit clock and receive clock (both from the ETC pin) from the user equipment.

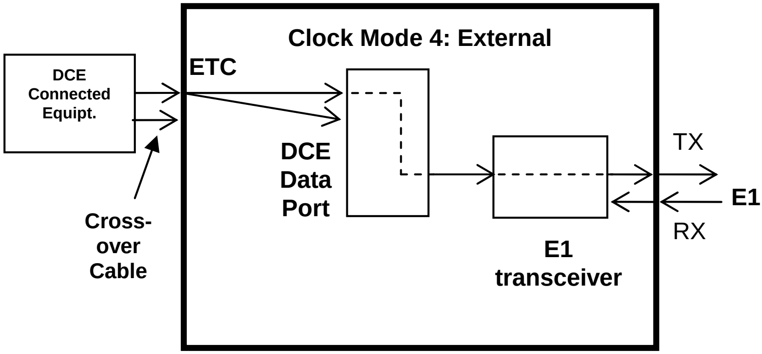


Figure 1.5 External Timing

The clock input from the ETC pin provides both clocking sources for the receive timing and for the user data transmit timing as well as clock for the E1 transmit link.

1.6 Functional Description

The ETU01 is a single port access unit for E1 or Fractional E1 service. The ETU01U is a single port access unit for Unframed E1 only. The ETU01 AC model has a universal, auto-switching power supply (90~250VAC) while the DC model's internal regulator module accepts DC voltages from 18 to 75 volts.

The ETU01 data channel supports user-selectable transmission rates, which are integer multiples of 56 or 64kbps, up to a maximum 2.048Mbps, for a line attenuation of up to 43 dB on twisted pair or coax cable. This provides an approximate operating range up to 2km (22AWG). (The ETU01U data interface supports a full 2.048Mbps unframed rate ONLY.)

The ETU01 packs the data channel into E1 link time slots in user-selected time slots. The unused time slots can insert IDLE code (In frame mode) or insert the receive side time slots data (In cascade mode). (The ETU01U only supports unframed mode and transparently uses the entire E1 bandwidth.)

The ETU01 fully meets all of the E1 specifications including ITU-T G.703, G.704, G.706, G.732, and G.823.

1.7 Loopback Feature

The ETU01 features V.54 diagnostic capabilities for performing local loop back and remote digital loop back. The operator at either end of the line may test both the ETU01 and the line in the digital loop back mode. The loop back is controlled by either a manual switch or by the V.35 DTE interface.

A front panel switch generates an internal 511 bit pseudo random test pattern, according to ITU-T, for direct end-to-end integrity testing. The Error indicator flashes for each bit error detected.

1.8 Typical System Applications

The fractional E1 data service is based on the assumption that the user data rate is a fraction of the available E1 bandwidth, in multiples of 56K or 64K. In a typical application (Figure 1.6), the ETU01 is used to connect the synchronous user DTEs over an E1 line.

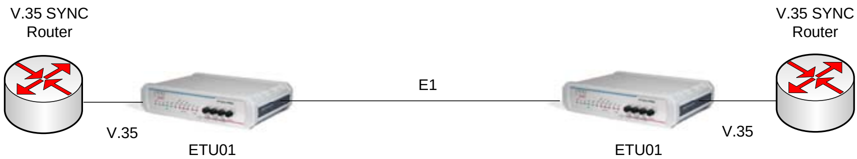


Figure 1.6 E1 Point-to-Point Application

When connected in this fashion, one ETU01 must have its clock set to Internal Oscillator to provide a reference clock for the E1. The unit on the opposite side of the E1 link will set its clocking to E1 Recovery.

Line coding, Framing, and Timeslot assignment must match on both sides. The ETU01 supports assigning timeslots in any order, from 1 to 31 (64Kbps to 1984Kbps) timeslots. When set to unframed, the ETU01 provides full 2048Kbps throughput between the V.35 DTE devices.

The ETU01U is not capable of fractional E1 operation and should be used where only an unframed, transparent 2.048Kbps transmission is required.

In the previous application, the ETU01 is connected over hardwire point to point. The ETU01 can also be connected to an E1 network or to E1's provided by SDH equipment. Within the SDH network, the E1 can be cross mapped at the VC12 level to provide point to point connections.

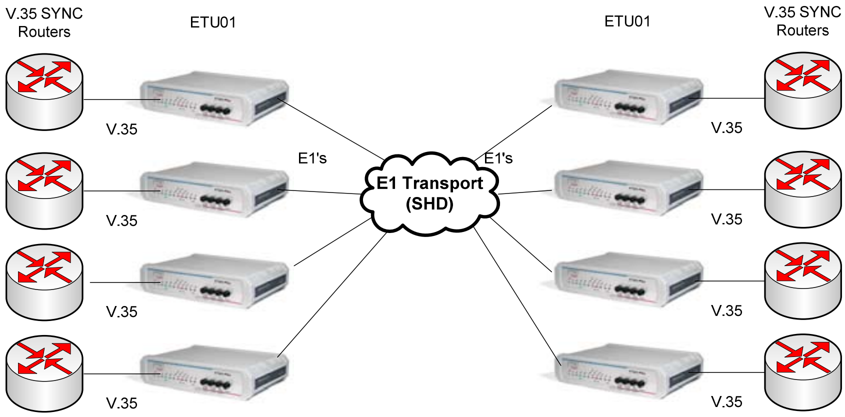


Figure 1.7 E1 Point-to-Point over SDH Application

In these cases the E1 timing will be set to "Recovery" to synchronize to the SDH network's timing. In the following example, one unit will provide the E1 timing either by using its internal oscillator.

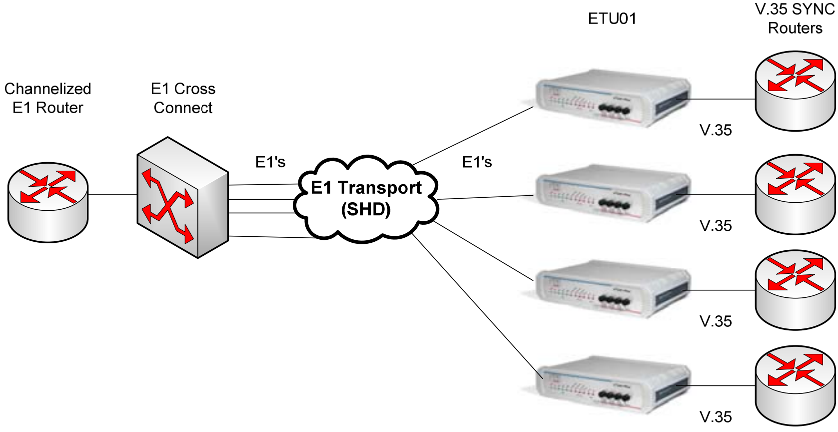


Figure 1.8 Application with Channelized E1

Chapter 2. Installation

2.1 General

This chapter provides detailed instructions for mechanical installation of the ETU01. Following the completion of installation, please refer to Chapter 3 for operating information.

2.2 Site Preparation

Install the ETU01 within reach of an easily accessible grounded AC outlet. DC power capable units connect via terminal block connection. Allow at least 10 cm (4 inch) clearance at the rear of the ETU01 for signal lines and interface cables.

2.3 Mechanical Assembly

The ETU01 is designed for tabletop or bench installation, and is delivered completely assembled. No provisions are made for bolting the ETU01 to the tabletop.

2.4 Electrical Installation

2.4.1 Power connection

AC power is supplied to the ETU01 through a standard 3-prong IEC C6 receptacle (Refer to Figure 2.1) while the DC model utilizes a three pin terminal block (Refer to Figure 2.2). The ETU01 should always be grounded through the protective earth lead of the AC power cable or via Frame Ground (FG) terminal connection.

2.4.2 Rear panel connectors

The G.703 E1 interface connectors, located on the rear panel of the ETU01, incorporate two BNC Coax and an RJ-45 connectors. (Appendix C&D provide detailed information on the various interface connectors).

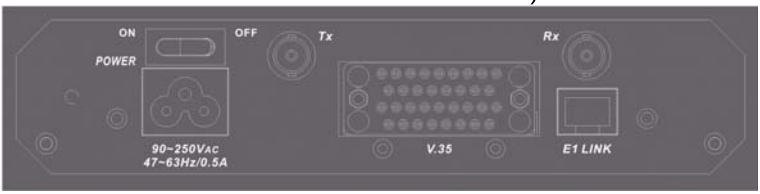


Figure 2.1 ETU01 rear panel AC

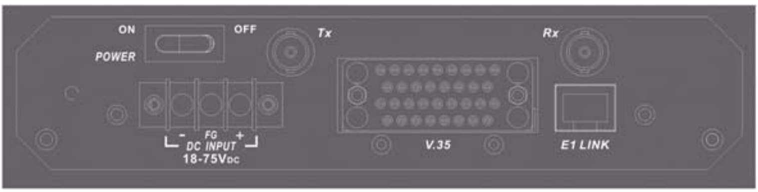
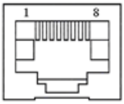


Figure 2.2 ETU01 rear panel DC

E1 Line

BNC coax connector
Two BNC coax connectors marked TX and RX.

RJ-45 Connector
The pin assignments for the RJ-45 connector are as follows:



Pin:	Function:
4	TTIP (Transmit data out)
5	TRING (Transmit data out)
1	RTIP (Receive data in)
2	RRING (Receive data in)

Cable and Termination

Use a shielded twisted pair cable between the ETU01 and the DTE device. The receivers on the ETU01 are 100 Ohm terminated. If problems are encountered with the connection to the V.35 DTE interface, make sure that the DTE interface is terminated correctly.

2.5 DIP Switches

2.5.1 Caution

To avoid accidental electric shock, disconnect the ETU01 power cord before opening the cover. Access inside the equipment is only permitted to authorized and qualified service personnel.

2.5.2 Procedure

1. Turn power OFF.
2. Disconnect all interface connections and the power cord from the AC outlet.
3. Loosen the screws at the left/right of the rear panel.
4. Remove the PCB.
5. Adjust the DIP switches as required, according to the tables in Appendix A.
6. Replace the PCB and tighten the screws.
7. Return all interface and power connections.
8. Turn power ON.

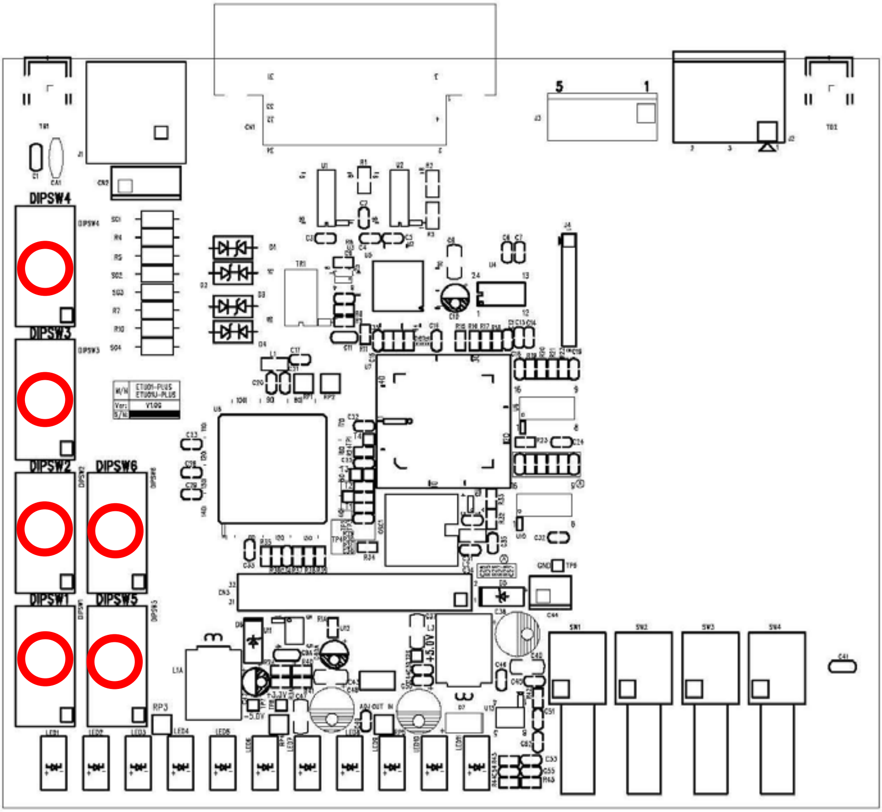


Figure 2.3 ETU01 DIP Switches, Version 1.2G PCB

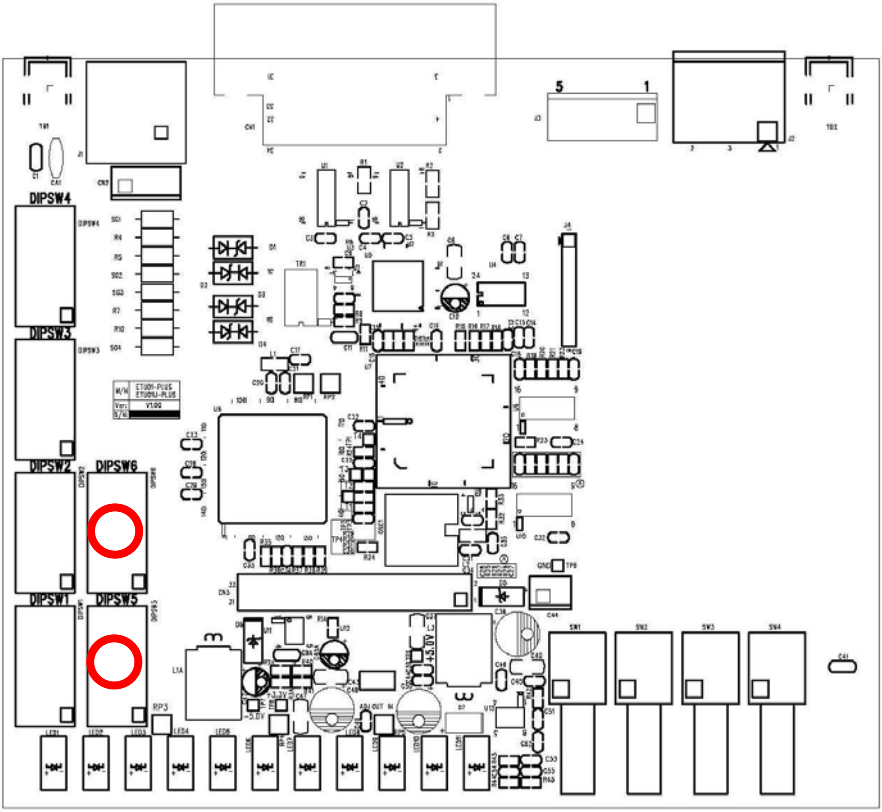


Figure 2.4 ETU01U DIP Switches, Version 1.2G PCB

Note: There are no timeslot setting switches (SW1-4) on the ETU01U model.

Chapter 3. Operation

3.1 General

This chapter describes the ETU01 controls and indicators, explains operating procedures, and supplies instructions for settings. Installation procedures (in Chapter 2) must be completed and checked before attempting to operate the ETU01.

3.2 Controls and Indicators

All controls (push-button switches) and LED indicators are located on the ETU01 front panel. Depress a push-button to activate (turn ON) the corresponding control. Release the push-button to deactivate (turn OFF) the control.

The function of each push-button and indicator is described in Table 3.1 and Table 3.2.



Figure 3.1 ETU01 Front Panel



Figure 3.2 ETU01U Front Panel

Table 3.1 Control Functions

Item	Control Switch	Function
1	Loc dig loopbk	The local digital loop back switch causes the local ETU01 to loop E1 received data to its transmitter.
2	Loc ana loopbk	The local analog loop back switch causes the local ETU01 to loop transmitter output back to its receiver. The transmitter sends 'all ones' data to the line. This loop back may also be activated from the DTE when the data port loop back test function is set to ENA (enable).
3	Rem loopbk	The remote loop back switch causes the remote ETU01 to loop E1 received data to its transmitter. This loop back may also be activated from the DTE when the data port loop back test function is set to ENA (enable).
4	Pattern	The pattern switch causes the ETU01 to send and receive a 511 test pattern. If errors are encountered, the Error LED indicator lights.

Table 3.2 LED indicators

Item	Indicator	Color	Meaning
1	PWR	Green	ON when power is on.
2	TD	Green	ON when SPACE is being transmitted. Flashing when data is transmitted.
3	RD	Green	ON when SPACE is being received. Flashing when data is received.
4	RTS	Green	ON when terminal activates Request To Sent.
5	DCD	Green	ON when a valid receive signal is present.
6	Tx CLK Loss	Red	ON when transmitted clock is lost.
7	Signal Loss	Red	ON when received signal is lost.
8	Sync Loss	Red	ON when received frame sync is lost.
9	Alarm	Red	ON when E1 link has an alarm. (Include: BPV error / CRC4 error / Frame slip / All ones / Remote alarm).
10	Error	Red	ON when Pattern switch is activated and bit errors are detected.
11	Test	Red	ON when the ETU01 is in any loop back mode or Pattern is depressed.

3.3 Operating Procedure

The ETU01 requires no operator attention once installed, except for occasional monitoring of the front panel indicators. Intervention is only required when:
1. The ETU01 has to be adapted to new operational requirements.
2. Diagnostic loops are required.

3.3.1 Visual Indicators

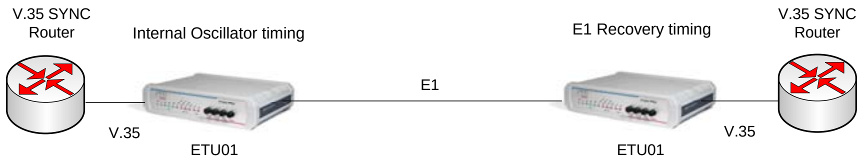
The ETU01 is turned on when its AC power cord (or central office DC power) is connected to an AC power outlet (or the DC input connections) and the power switch is turned to the ON position. Initially, all LEDs will light, followed by all LEDs flashing rapidly 5 times. This will indicate that the ETU01 is on and CPU has booted successfully. Verify the ETU01 is in operation by checking that the front panel LED's match the following indicator conditions:

PWR: ON
TD: ON, OFF or Flashing
RD: ON, OFF or Flashing
RTS: ON (Off if no DTE device is connected)
DCD: ON (Off if E1 is not linked)
Tx CLK Loss: OFF
Signal Loss: OFF (On if no E1 receive signal is detected)
Sync Loss: OFF (On if E1 has no frame sync)
Alarm: OFF
Err: OFF
Test: OFF

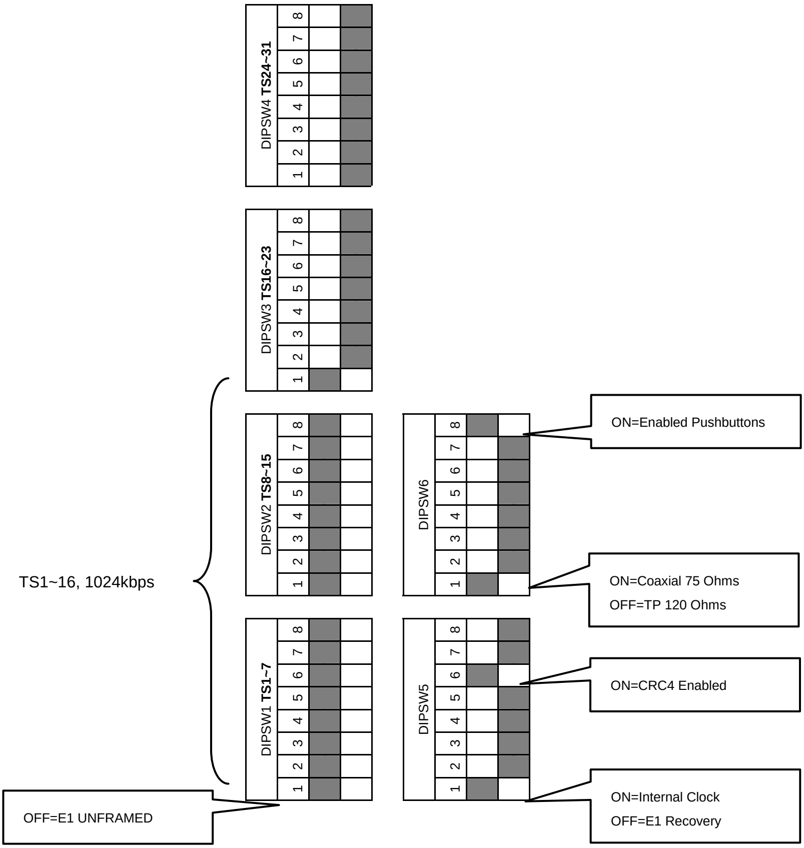
3.3.2 Configuration Settings

When connecting this equipment to service providers line, gather the following information, then refer to the DIP switch tables to provision the unit.
1. Connect by Coaxial or Twisted Pair cable?
Coaxial cable terminates in BNC connectors @75 Ohms, while twisted pair uses the RJ-45 connector @ 120 Ohms – See DIP SW6-1
2. Frame type is Unframed, CCS (PCM31) or CAS (PCM30) with or without CRC4?
Unframed is also called 'transparent' or 'un-structured' E1. CAS includes signaling that is typical with voice over E1 applications. – See DIP SW1-1, SW5-5 & SW5-6.
3. Timeslot assignment determines the data rate. ETU01 supports completely random assignment. Timeslot settings have no effect if framing is Unframed. – see DIP SW1, 2, 3, 4, 5
4. Line coding is typically HDB3, but the ETU01 also supports AMI. – see DIP SW5-4
5. E1 timing when connecting to ISP is almost always 'recovery' or clocked from the main E1 timing. – see DIP SW5-1,2,3 (recovery timing has them all set OFF)

3.4 Quick Start Guide



Based on the above point to point application, use the following DIP switch graphic to visually set the ETU01 units. This example will use CCS (PCM31) framing with CRC4 and provide 1024kbps (16 timeslots) throughput.



Chapter 4. Test & Diagnostics

4.1 General

This chapter contains procedures for performing system diagnostic tests.

4.2 Loop Back Tests

The loop back test buttons (Loc dig loopbk, Loc ana loopbk and Rem loopbk) and the LED indicators built into the ETU01 allow for rapid checking of the data terminal, ETU01 and the E1 line. Before testing the operation of the data system equipment and their line circuits, ensure that all units are turned on and are configured correctly. Note: DIP SW6-8 must be set ON to enable the front panel push-button switches.

4.3 Bit Error Rate Tester

When depressing the Pattern push-button switch, the Bit Error Rate Tester (BERT) can be activated in any diagnostics test in which the test pattern transmitted is received by another ETU01 (see Figure 4.1). When used opposite another ETU01, either with the Pattern push-button switch depressed or with an external BERT transmitting the same pattern (V.52 511-bit), the complete link can be tested. If errors are encountered, the Error indicator LED will blink (for intermittent errors) or remain on continuously (for continuous errors).

In this example, both units at the ends of the E1 link have their pattern generators enabled.

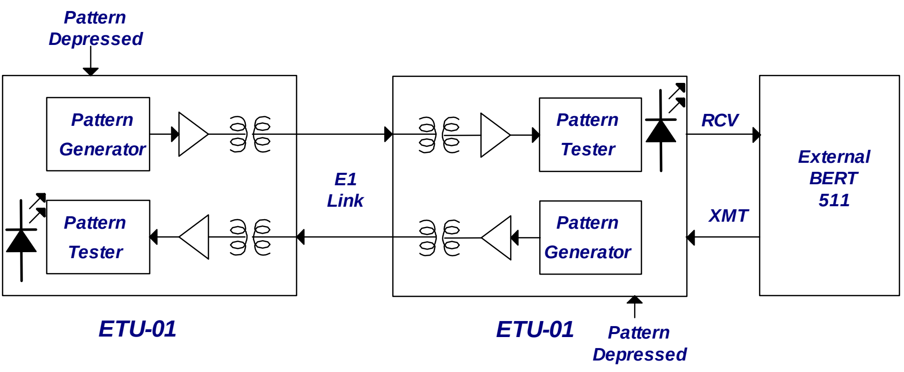


Figure 4.1 BERT operation

4.4 Local Analog Loop Back

This test is activated by depressing the "Loc ana loopbk" button. This test checks the performance of the ETU01, the local data terminal and the connections between them. It is performed separately at the local and the remote sites (see Figure 4.2):

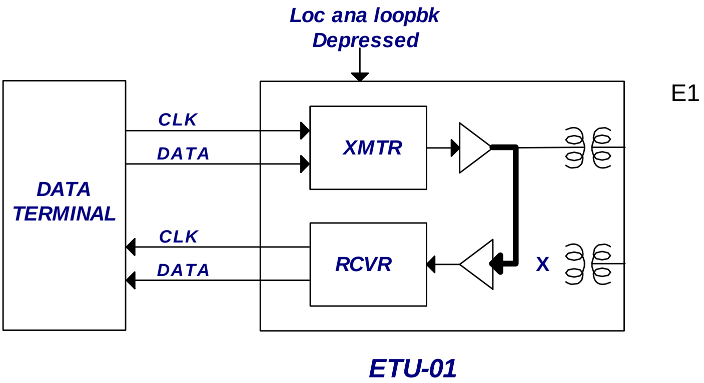


Figure 4.2 Local analog loop back

4.5 Local Digital Loop Back

This test is activated by depressing the "Loc dig loopbk" button. The test consists of looping the received data back to the remote ETU01. This test checks the performance of the local ETU01, the remote ETU01 and the connections between them (see Figure 4.3).

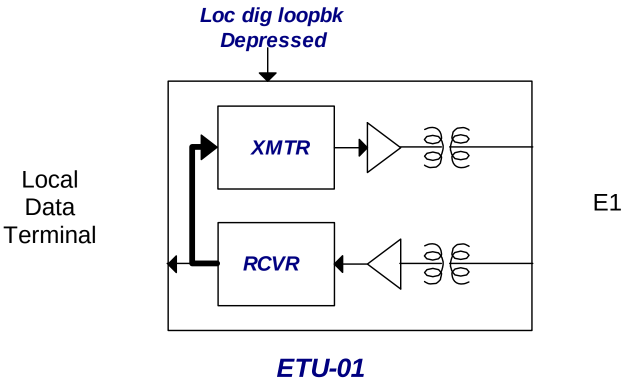


Figure 4.3 Local digital loop back

4.6 Remote Digital Loop Back

This test is activated by depressing the "Rem loopbk" push button. The test determines the performance both of the local and the remote ETU01 units, as well as their interconnecting lines. The remote digital loop back test consists of providing a loop back at the remote ETU01 (see Figure 4.4).

A system test may be performed by first depressing the remote loop back switch, then depressing the pattern switch. The test pattern will be generated, sent out the E1 link and looped back by the remote unit. If no errors are indicated by the error LED, the link test has been successful.

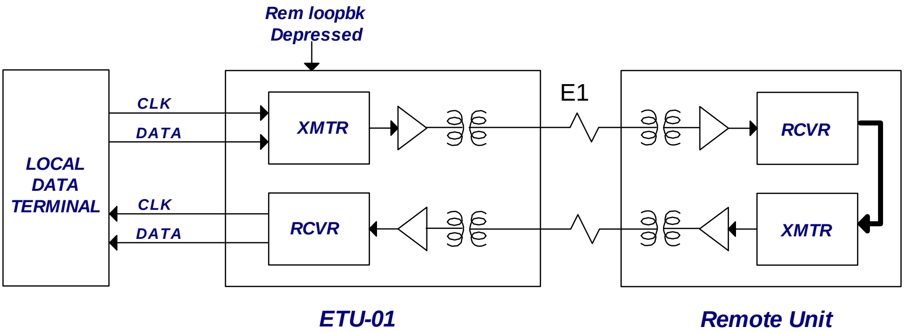


Figure 4.4 Remote digital loop back

4.7 Quick E1 Self-test

Use this "Quick Test" to check the E1 circuits for a standalone unit.

Set DIP switches all OFF, except:
DIP SW5-1 ON (Internal Osc. Timing)
DIP SW6-1 ON (75 Ohm for Coax Cable)
DIP SW6-8 ON (enable pushbuttons)

Connect the E1 Tx to E1 Rx with a single coaxial cable.
Press the Pattern/test switch.

Test LED will remain Red. The E1 Tx and Rx circuits will be tested and pass if the 'Error' LED is not lit.

Without any coaxial cable connected, the logic circuits can be tested by pressing both the 'Pattern' and 'Loc ana loopbk' switches. No 'Error' should light.

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Appendix

A.1 ETU01 All DIP Switch Overview

DIP SW GROUP	FUNCTION	COMMENT
1	Time slot 0 to 7 setting	See Table A.2
2	Time slot 8 to 15 setting	See Table A.3
3	Time slot 16 to 23 setting	See Table A.4
4	Time slot 24 to 31 setting	See Table A.5
5	Parameter group 1 setting	See Table A.6
6	Parameter group 2 setting	See Table A.7

Table A.1 All DIP Switch Overview

A.2 DIP SW1 Time Slot 0 To 7 Setting

DIP SW1 NO.	STATE	FUNCTION	COMMENT
-1	OFF	Unframed mode	
	ON	Framed mode	
-2	OFF	Time slot 1 disable	
	ON	Time slot 1 enable	
-3	OFF	Time slot 2 disable	
	ON	Time slot 2 enable	
-4	OFF	Time slot 3 disable	
	ON	Time slot 3 enable	
-5	OFF	Time slot 4 disable	
	ON	Time slot 4 enable	
-6	OFF	Time slot 5 disable	
	ON	Time slot 5 enable	
-7	OFF	Time slot 6 disable	
	ON	Time slot 6 enable	
-8	OFF	Time slot 7 disable	
	ON	Time slot 7 enable	

Table A.2 DIP SW1 Time Slot 0 to 7 Setting

A.3 DIP SW2 Time Slot 8 To 15 Setting

DIP SW2 NO.	STATE	FUNCTION	COMMENT
-1	OFF	Time slot 8 disable	
	ON	Time slot 8 enable	
-2	OFF	Time slot 9 disable	
	ON	Time slot 9 enable	
-3	OFF	Time slot 10 disable	
	ON	Time slot 10 enable	
-4	OFF	Time slot 11 disable	
	ON	Time slot 11 enable	
-5	OFF	Time slot 12 disable	
	ON	Time slot 12 enable	
-6	OFF	Time slot 13 disable	
	ON	Time slot 13 enable	
-7	OFF	Time slot 14 disable	
	ON	Time slot 14 enable	
-8	OFF	Time slot 15 disable	
	ON	Time slot 15 enable	

Table A.3 DIP SW2 Time Slot 8 to 15 Setting

A.4 DIP SW3 Time Slot 16 To 23 Setting

DIP SW3 NO.	STATE	FUNCTION	COMMENT
-1	OFF	Time slot 16 disable	
	ON	Time slot 16 enable	Note 1
-2	OFF	Time slot 17 disable	
	ON	Time slot 17 enable	
-3	OFF	Time slot 18 disable	
	ON	Time slot 18 enable	
-4	OFF	Time slot 19 disable	
	ON	Time slot 19 enable	
-5	OFF	Time slot 20 disable	
	ON	Time slot 20 enable	
-6	OFF	Time slot 21 disable	
	ON	Time slot 21 enable	
-7	OFF	Time slot 22 disable	
	ON	Time slot 22 enable	
-8	OFF	Time slot 23 disable	
	ON	Time slot 23 enable	

Table A.4 DIP SW3 Time Slot 16 to 23 Setting

Note 1: In CAS mode (PCM30), DIPSW3-1 must not be set to ON.

A.5 DIP SW4 Time Slot 24 To 31 Setting

DIP SW4 NO.	STATE	FUNCTION	COMMENT
-1	OFF	Time slot 24 disable	
	ON	Time slot 24 enable	
-2	OFF	Time slot 25 disable	
	ON	Time slot 25 enable	
-3	OFF	Time slot 26 disable	
	ON	Time slot 26 enable	
-4	OFF	Time slot 27 disable	
	ON	Time slot 27 enable	
-5	OFF	Time slot 28 disable	
	ON	Time slot 28 enable	
-6	OFF	Time slot 29 disable	
	ON	Time slot 29 enable	
-7	OFF	Time slot 30 disable	
	ON	Time slot 30 enable	
-8	OFF	Time slot 31 disable	
	ON	Time slot 31 enable	

Table A.5 DIP SW4 Time Slot 24 to 31 Setting

A.6 DIP SW5 Parameter Group 1 Setting

DIP SW5 NO.	STATE STATE			FUNCTION	COMMENT
-1,-2,-3	OFF	OFF	OFF	Clock mode 0 (DCE1)	See Table A-8
	ON	OFF	OFF	Clock mode 1 (DCE1)	
	OFF	ON	OFF	Clock mode 2 (DTE1)	
	ON	ON	OFF	Clock mode 3 (DTE2)	
	OFF	OFF	ON	Clock mode 4 (DTE3)	
	ON	OFF	ON	Reserved	
	OFF	ON	ON	Reserved	
	ON	ON	ON	Reserved	
-4	OFF			Line code: HDB3	
	ON			Line code: AMI	
-5	OFF			Frame mode: CCS (PCM31)	
	ON			Frame mode: CAS (PCM30)	
-6	OFF			CRC4: OFF	
	ON			CRC4: ON	
-7	OFF			Idle code: Mark (0xFF)	
	ON			Idle code: Flag (0x7E)	
-8	OFF			Data channel rate: N×64	
	ON			Data channel rate: N×56	

Table A.6 DIP SW5 Parameter Group 1 Setting

A.7 DIP SW6 Parameter Group 2 Setting

DIP SW6 NO.	STATE STATE	FUNCTION	COMMENT
-1	OFF	Line Impedance: 120 Ohm	Coaxial (BNC)
	ON	Line Impedance: 75 Ohm	TP (RJ-45)
-2	OFF	RC Phase: Normal	
	ON	RC Phase: Inverted	
-3	OFF	TC Phase: Normal	
	ON	TC Phase: Inverted	
-4	OFF	DCD always ON, except E1 Sig.Loss	
	ON	DCD follows RTS, except E1 Sig.Loss	
-5	OFF	Reserved	
	ON	Reserved	
-6	OFF	Reserved	
	ON	Reserved	
-7	OFF	Data port loopback: Disable	
	ON	Data port loopback: Enable	
-8	OFF	Front panel push buttons: Disable	
	ON	Front panel push buttons: Enable	

Table A.7 DIP SW6 Parameter Group 2 Setting

A.8 Clock Mode Details

CLOCK MODE	DIPSW 5 STATE -1	-2	-3	E1 LINE TRANSMIT CLOCK	USER DATA PORT RECEIVE CLOCK	USER DATA PORT TRANSMIT CLOCK
0 (DCE1)	OFF	OFF	OFF	RECOVERY	RECOVERY Output to RC	RECOVERY Output to TC
1 (DCE2)	ON	OFF	OFF	INTERNAL OSCILLATOR	INTERNAL Output to RC	INTERNAL Output to TC
2 (DTE1)	OFF	ON	OFF	EXTERNAL Follows ETC	RECOVERY Output to RC	EXTERNAL Input from ETC
3 (DTE2)	ON	ON	OFF	EXTERNAL Follows ETC	EXTERNAL Input from ERC	EXTERNAL Input from ETC
4 (DTE3)	OFF	OFF	ON	EXTERNAL Follows ETC	EXTERNAL Input from ETC	EXTERNAL Input from ETC

Table A.8 Clock Mode Details

B.1 ETU01U All DIP Switch Overview

DIP SW GROUP	FUNCTION	COMMENT
5	Parameter group 1 setting	See Table B.2
6	Parameter group 2 setting	See Table B.3

Table B.1 All DIP Switch Overview

Note: The ETU01U operates in unframed mode ONLY. The user data rate is fixed at 2048K. DIPSW1 to DIPSW4 are not installed on the PCBA. The settings for DIPSW5 bits 5-8 and DIPSW6 bits 4-5 do not matter.

B.2 DIP SW5 Parameter Group 1 Setting

DIP SW5 NO.	STATE STATE			FUNCTION	COMMENT
-1,-2,-3	OFF	OFF	OFF	Clock mode 0 (DCE1)	See Table B-4
	ON	OFF	OFF	Clock mode 1 (DCE1)	
	OFF	ON	OFF	Clock mode 2 (DTE1)	
	ON	ON	OFF	Clock mode 3 (DTE2)	
	OFF	OFF	ON	Clock mode 4 (DTE3)	
	ON	OFF	ON	Reserved	
	OFF	ON	ON	Reserved	
	ON	ON	ON	Reserved	
-4	OFF			Line code: HDB3	
	ON			Line code: AMI	
-5	OFF			Don't care	No function on ETU01U
	ON			Don't care	
-6	OFF			Don't care	
	ON			Don't care	
-7	OFF			Don't care	
	ON			Don't care	
-8	OFF			Don't care	
	ON			Don't care	

Table B.2 DIP SW5 Parameter Group 1 Setting

B.3 DIP SW6 Parameter Group 2 Setting

DIP SW6 NO.	STATE STATE	FUNCTION	COMMENT
-1	OFF	Line Impedance: 120 Ohm	Coaxial (BNC)
	ON	Line Impedance: 75 Ohm	TP (RJ-45)
-2	OFF	RC Phase: Normal	
	ON	RC Phase: Inverted	
-3	OFF	TC Phase: Normal	
	ON	TC Phase: Inverted	
-4	OFF	DCD always ON, except E1 Sig.Loss	
	ON	DCD follows RTS, except E1 Sig.Loss	
-5	OFF	Reserved	
	ON	Reserved	
-6	OFF	Reserved	
	ON	Reserved	
-7	OFF	Data port loopback: Disable	
	ON	Data port loopback: Enable	
-8	OFF	Front panel push buttons: Disable	
	ON	Front panel push buttons: Enable	

Table B.3 DIP SW6 Parameter Group 2 Setting

B.4 Clock Mode Details

CLOCK MODE	DIPSW 5 STATE -1	-2	-3	E1 LINE TRANSMIT CLOCK	USER DATA PORT RECEIVE CLOCK	USER DATA PORT TRANSMIT CLOCK
0 (DCE1)	OFF	OFF	OFF	RECOVERY	RECOVERY Output to RC	RECOVERY Output to TC
1 (DCE2)	ON	OFF	OFF	INTERNAL OSCILLATOR	INTERNAL Output to RC	INTERNAL Output to TC
2 (DTE1)	OFF	ON	OFF	EXTERNAL Follows ETC	RECOVERY Output to RC	EXTERNAL Input from ETC
3 (DTE2)	ON	ON	OFF	EXTERNAL Follows ETC	EXTERNAL Input from ERC	EXTERNAL Input from ETC
4 (DTE3)	OFF	OFF	ON	EXTERNAL Follows ETC	EXTERNAL Input from ETC	EXTERNAL Input from ETC

Table B.4 Clock Mode Details

Appendix C. Interface Connections

C.1 E1 Line Connectors

C.1.1 BNC Connectors

Conn.	Pin	Designation	Direction	Function
TX	Center	TTIP	From ETU01	Transmit data
	Sleeve	TRING	↔	Signal return
RX	Center	RTIP	To ETU01	Receive data
	Sleeve	RRING	↔	Signal return

Table C.1a E1 BNC connector pin allocation

C.1.2 RJ-45 Connector

The RJ-45 E1 connector follows USOC RJ-48C standard for terminating equipment.

	Pin	Designation	Direction	Function
RJ-45	4	TRING	From ETU01	Transmit data(-)
	5	TTIP		Transmit data(+)
	7	FG	↔	Frame ground
	1	RRING	To ETU01	Receive data(-)
	2	RTIP		Receive data(-)
	8	FG	↔	Frame ground

Table C.1b E1 RJ-45 connector pin allocation

C.2 X.21 Data Module Connector

When the ***ETU-01*** is ordered with an X.21 interface, the physical interface is a 15-pin female D-type connector wired in accordance with Table C.2.

SIGNAL FUNCTION	PIN	CIRCUIT	DIRECTION	DESCRIPTION
Protective Ground	**1**	**Shield**	**←→**	**Chassis ground. May be isolated from Signal Ground.**
Signal Ground	**8**	**G**	**←→**	**Common signal ground.**
Transmitted Data	**2 9**	**T(A) T(B)**	**To *ETU-01***	**Serial digital data from DTE.**
Received Data	**4 11**	**R(A) R(B)**	**Fm *ETU-01***	**Serial digital data at the output of the *ETU-01* receiver.**
Request to Sent	**3 10**	**C(A) C(B)**	**To *ETU-01***	**A ON signal to the *ETU-01* when data transmission is desired.**
Data Carrier Detect	**5 12**	**I(A) I(B)**	**Fm *ETU-01***	**Constantly ON, except when Rx carrier signal loss is detected.**
Signal Timing	**6 13**	**S(A) S(B)**	**Fm *ETU-01***	**A transmit data rate clock for use by an external data source.**
External Tx clock	**7 14**	**B(A) B(B)**	**To *ETU-01***	**A serial data rate clock input from the data source.**

Table C.2 X.21 data module connector pin allocation

C.3 RS-232 Data Module Connector

When the ***ETU-01*** is ordered with a RS-232 interface, the physical interface is a 25-pin female D-type connector wired in accordance with Table C.3.

SIGNAL FUNCTION	PIN	CIRCUIT	DIRECTION	DESCRIPTION
Shield	1	AA	←→	Chassis ground. May be isolated from signal ground.
Signal Ground	7	AB	←→	Common signal ground.
Transmitted Data	2	BA	To ETU-01	Serial digital data from DTE.
Received Data	3	BB	From ETU-01	Serial digital data at the output of the ETU-01 receiver.
Request to Sent	4	CA	To ETU-01	A ON signal to the ETU-01 when data transmission is desired.
Clear to Sent	5	CB	From ETU-01	Constantly ON.
Data Set Ready	6	CC	From ETU-01	Constantly ON, except during test loops.
Data Terminal Ready	20	CD	To ETU-01	Not used.
Data Carrier Detect	8	CF	From ETU-01	Constantly ON, except when a loss of the received carrier signal is detected.
External Transmit clock	24	DA	To ETU-01	A transmitted data rate clock input from the data source.
Transmit Clock	15	DB	From ETU-01	A transmitted data rate clock for use by an external data source.
Receive Clock	17	DD	From ETU-01	A received data rate clock for use by an external data source.

Table C.3 RS-232 data module connector pin allocation

C.4 V.35 Data Module Connector

When the ***ETU-01*** is ordered with a V.35 interface, the physical interface is a 34-pin female M-type connector wired in accordance with Table C.4.

SIGNAL FUNCTION	PIN	CIRCUIT	DIRECTION	DESCRIPTION
Protective Ground	A	Frame	←→	Chassis ground. May be isolated from signal ground.
Signal Ground	B	Signal Ground	←→	Common signal ground.
Transmitted Data	P S	TD(A) TD(B)	To ETU-01	Serial digital data from DTE.
Received Data	R T	RD(A) RD(B)	From ETU-01	Serial digital data at the output of the ETU-01 receiver.
Request to Sent	C	RTS	To ETU-01	A ON signal to the ETU-01 when data transmission is desired.
Clear to Sent	D	CTS	From ETU-01	Constantly ON.
Data Set Ready	E	DSR	From ETU-01	Constantly ON, except during test loops.
Data Terminal Ready	H	DTR	To ETU-01	Not used.
Data Carrier Detect	F	DCD	From ETU-01	Constantly ON, except when a loss of the received carrier signal is detected.
External Transmit clock	U W	ETC(A) ETC(B)	To ETU-01	A transmitted data rate clock input from the data source.
Transmit Clock	Y AA	TC(A) TC(B)	From ETU-01	A transmitted data rate clock for use by an external data source.
Receive Clock	V X	RC(A) RC(B)	From ETU-01	A received data rate clock for use by an external data source.
External Receive clock	Z BB	ERC(A) ERC(B)	To ETU-01	A received serial data rate clock input from the DTE.
Remote Loopback	HH	RL	To ETU-01	When on, commands ETU-01 into remote loopback, can disable by dipsw.
Local Loopback	JJ	LL	To ETU-01	When on, commands ETU-01 into local loopback, can disable by dipsw.
Test Indicator	KK	TM	From ETU-01	ON during any test mode

Table C.4 V.35 data module connector pin allocation

C.5 RS-530 Data Module Connector

When the ***ETU-01*** is ordered with an RS-530 interface, the physical interface is a 25-pin female D-type connector wired in accordance with Table C.5.

SIGNAL FUNCTION	PIN	CIRCUIT	DIRECTION	DESCRIPTION
Protective Ground	1	Frame	←→	Chassis ground. May be isolated from signal ground.
Signal Ground	7	AB	←→	Common signal ground.
Transmitted Data	2 14	BA(A) BA(B)	To ETU-01	Serial digital data from DTE.
Received Data	3 16	BB(A) BB(B)	From ETU-01	Serial digital data at the output of the ETU-01 receiver.
Request to Sent	4 19	CA(A) CA(B)	To ETU-01	A ON signal to the ETU-01 when data transmission is desired.
Clear to Sent	5 13	CB(A) CB(B)	From ETU-01	Constantly ON.
Data Set Ready	6 22	CC(A) CC(B)	From ETU-01	Constantly ON, Except during test loops.
Data Terminal Ready	20 23	CD(A) CD(B)	To ETU-01	DTR not used, used for a received serial data rate clock input from the DTE.
Data Carrier Detect	8 10	CF(A) CF(B)	From ETU-01	Constantly ON, except when a loss of the received carrier signal is detected.
External Transmit clock	24 11	DA(A) DA(B)	To ETU-01	A transmitted data rate clock input from the data source.
Transmit Clock	15 12	DB(A) DB(B)	From ETU-01	A transmitted data rate clock for use by an external data source.
Receive Clock	17 9	DD(A) DD(B)	From ETU-01	A received data rate clock for use by an external data source.
Remote Loopback	21	RL	To ETU-01	When on, commands ETU-01 into remote loopback, can disable by dipsw.
Local Loopback	18	LL	To ETU-01	When on, commands ETU-01 into local loopback, can disable by dipsw.
Test Indicator	25	TM	From ETU-01	ON during any test mode

Table C.5 RS-530 data module connector pin allocation

C.6 RS-530 to RS-449 Adapter Cable

When the ***ETU-01*** is ordered with a RS-449 interface, the physical interface is a 25 pin D-type connector (RS-530) with an adapter cable to 37-pin male D-type connector wired in accordance with Table C.6.

SIGNAL FUNCTION	RS-530 PIN	RS-449 PIN	RS-449 CIRCUIT	DESCRIPTION
Protective Ground	1	1	Frame	Chassis ground. May be isolated from signal ground.
Signal Ground	7	19,20, 37	SG,RC, SC	Common signal ground.
Transmitted Data	2 14	4 22	SD(A) SD(B)	Serial digital data from DTE.
Received Data	3 16	6 24	RD(A) RD(B)	Serial digital data at the output of the ETU-01 receiver.
Request to Sent	4 19	7 25	RS(A) RS(B)	A ON signal to the ETU-01 when data transmission is desired.
Clear to Sent	5 13	9 27	CS(A) CS(B)	Constantly ON.
Data Set Ready	6 22	11 29	DM(A) DM(B)	Constantly ON, Except during test loops.
Data Terminal Ready	20 23	12 30	TR(A) TR(B)	DTR not used, used for a received serial data rate clock input from the DTE.
Data Carrier Detect	8 10	13 31	RR(A) RR(B)	Constantly ON, except when a loss of the received carrier signal is detected.
External Transmit clock	24 11	17 35	TT(A) TT(B)	A transmitted data rate clock input from the data source.
Transmit Clock	15 12	5 23	ST(A) ST(B)	A transmitted data rate clock for use by an external data source.
Receive Clock	17 9	8 26	RT(A) RT(B)	A received data rate clock for use by an external data source.
Remote Loopback	21	14	RL	When on, commands ETU-01 into remote loopback, can disable by dipsw.
Local Loopback	18	10	LL	When on, commands ETU-01 into local loopback, can disable by dipsw.
Test Indicator	25	18	TM	ON during any test mode

Table C.6 RS-530 to RS-449 pin allocation

C.7 G.703/64K Codirectional Connector

When the ***ETU-01*** is ordered with a G.703/64K interface, the physical interface is a 15-pin female D-type connector wired in accordance with Table C.7.

SIGNAL FUNCTION	PIN	DIRECTION	DESCRIPTION
Protective Ground	**4 10**	←→	**Chassis ground. May be isolated from Signal Ground.**
Signal Ground	**8**	←→	**Common signal ground.**
Transmitted Data	**3 11**	**To *ETU-01***	**Serial Codirectional data from DTE.**
Received Data	**1 9**	**Fm *ETU-01***	**Serial Codirectional data at the output of the *ETU-01* receiver.**

Table C.7 G.703/64K Codirectional pin allocation

C.8 G.703 NRZ

When the ***ETU-01*** is ordered with a G.703 NRZ interface, the physical interface is 4 BNC female connectors wired in accordance with Table C.8.

Specifications:

Line Code:	NRZ
Impedance:	50 ohms
Signal Level:	Logic "1": 0V +/- 0.3V
	Logic "0": -1.5V +/- 0.3V
Speed:	2048K Max.

SIGNAL FUNCTION	DIRECTION	DESCRIPTION
Received Data	**Fm *ETU-01***	**Serial NRZ data at the output of the *ETU-01* receiver.**
Received Timing	**Fm *ETU-01***	**Serial NRZ timing at the output of the *ETU-01* receiver.**
Transmitted Data	**To *ETU-01***	**Serial NRZ data from DTE.**
Transmit Timing	**To *ETU-01***	**Serial NRZ timing from DTE.**

Table C.8 G.703 NRZ/BNC pin allocation

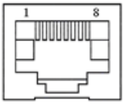
Settings: (by adjustment of jumpers on interface card)
Rx timing; "Normal" or "Inverted"
Tx timing; "Normal" or "Inverted"

C.9 ET100 10/100BASE-TX Ethernet Bridge



When the ***ETU-01*** is ordered with an **ET10/100 Interface**, the unit is not only an access unit for E1, but also becomes a high performance WAN bridge for 10Base-T or 100Base-TX Ethernet extension. The physical interface is a RJ-45 connector, with the pin assignment as follows:

MDI	MDI-X
1. Tx +	1. Rx +
2. Tx -	2. Rx -
3. Rx +	3. Tx +
6. Rx -	6. Tx -



DIP Switch Settings

DIP	STATE		FUNCTION
1	ON*		Enable MAC filtering
	OFF		Disable Filtering
2	ON		Enable 802.3x flow control
	OFF*		Disable 802.3x flow contol
3	ON		NO Auto-negotiation
	OFF*		Auto-negotiation
4	ON		Half Duplex[1]
	OFF*		Full Duplex[1]
5	ON		10BASE-T LAN speed[1]
	OFF*		100BASE-TX LAN speed[1]
6	ON*		Enable Auto MDIX
	OFF		MDI (1:1 to HUB)
7 | 8	OFF	OFF	Memory configuration #1
	ON	OFF	Memory configuration #2
	OFF	ON	Memory configuration #3
	ON	ON	Reserved

* factory default settings
[1] no effect when sw3 is off (auto-negotiation is on)
[2] Note : Some LAN card modules have a "Power Managment" feature. The Tx Side won't transmit data in "Sleep mode".
. In this case, if the "Link" status is not on, the switch #6 needs to be on the "ON"
position then the normal function should be remained.

LED Indicators

Designation	Indication
Full (yel)	ON=Full Duplex
Link (grn)	ON=LAN Link
Error (red)	ON=LAN Error
100M (yel)	ON=Fast Ethernet
Receive (yel)	ON=LAN Rx data
Transmit(yel)	ON=LAN Tx data

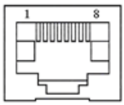
Memory configuration detail
#1 LAN to WAN 308 packets, WAN to LAN 32 packets
#2 LAN to WAN 170 packets, WAN to LAN 170 packets
#3 LAN to WAN 32 packets, WAN to LAN 308 packets

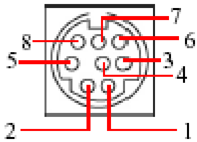
C.10 ET100R 10/100BASE-TX Ethernet Router



When the ***ETU-01*** is ordered with an **ET100R Interface**, the unit is not only an access unit for E1, but also becomes a high performance Router for 10Base-T or 100Base-TX Ethernet LAN connection. Configuration of the router is beyond the scope of this manual. Please refer to the CDROM based instructions that are included with the router module. The LAN physical interface is a RJ-45 connector. The ET100R router module is configured with via CLI commands on a RS-232 serial interface or via Telent. Configuration is also supported by web browser GUI. A special cable must be used to connect serial terminal to the modules DIN connector. Pinouts are provided below for reference.

MDI
1. Tx +
2. Tx -
3. Rx +
6. Rx -





RS-232
DTE

PIN	Circuit	Direction	Description
1	NC		
2	RX	IN	Receive data
3	TX	OUT	Transmit data
4	NC		
5	GND		Signal ground
6	NC		
7	RTS	OUT	Request to Send
8	CTS	IN	Clear to Send

At the time of this printing, the ***ETU-01*** has nine types of user-replaceable data channel modules.

1. ETU/TTU-V35



V.35 Module:
Provides one fully compliant ITU-T V.35 interface on a Female "M" block, 34 pin connector. Operates at any n56/n64 fractional or unframed E1 speed. No additional cable is included. This module presents DCE signals to a directly connected DTE device.

2. ETU/TTU-530



RS-530 Module:
Provides one fully compliant EIA RS-530 interface on a female "D" type 25 pin connector. Operates at any n56/n64 fractional or unframed E1 speed. No additional cable is included. This module presents DCE signals to a directly connected DTE device.

3. ETU/TTU-449



RS-449 Module:
Provides one fully compliant EIA RS-449 interface by placing an adapter cable on the ETU/TTU-530 module and providing a male "D" type 37 pin connector. Operates at any n56/n64 fractional or unframed E1 speed. The additional cable is included. This module presents DCE signals to a directly connected DTE device.

4. ETU/TTU-X21



X.21 Module:
Provides one fully compliant ITU-T X.21 interface on a female "D" type 15 pin connector. Operates at any n56/n64 fractional or unframed E1 speed. No additional cable is included. This module presents DCE signals to a directly connected DTE device.

5. ETU/TTU-232



RS-232 Module:
Provides one fully compliant EIA RS-232 SYNC interface on a female "D" type 25 pin connector. Operates at n56/n64 fractional E1 speed up to 128Kbps (ASYNC 19.2K). No additional cable is included. This module presents DCE signals to a directly connected DTE device.

6. ETU/TTU-G64



G.703/64K Module:
Provides one fully ITU-T compliant G.703 Codirectional (line code) 64Kbps interface on a female "D" type 15 pin connector. Operates at 64Kbps only. No additional cable is included. User must supply their own DB15F connector.

7. ETU/TTU-NRZ

NRZ Module:

Provides one NRZ interface on four(4) female BNC type connectors. Operates at any n56/n64 fractional or unframed E1 speed. The 4 signal cables provide TxData, RxData, TxClk and RxClk.



8. ETU/TTU-ET10/100

Ethernet Bridge Module:

Utilizes standard LAN pin out on one RJ-45 connector, providing connection to Ethernet (10Base-T) or Fast Ethernet (100Base-TX) networks utilizing UTP (unshielded twisted pair) cabling. Operates at any n56/n64 fractional or unframed E1 speed.



9. ETU/TTU-ET100R

Ethernet Router Module:

Provides an Ethernet (IEEE802.3 or IEEE802.3u) Router function over the WAN when matched to another ET100R module, Cisco router, or a compatible router under PPP or HDLC protocol. The interface connection is an auto MDI-X, 10/100BASE-TX Ethernet on a shielded RJ-45 connector. Configuration is via RS-232 terminal, Telnet, or via web based GUI. Operates at any n56/n64 fractional or unframed E1 speed.



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Attn : Technical Support Division
From Company: ______________________
Name: ______________________
Tel: (   ) ______________________
Fax:(   ) ______________________
MODEL: ☐ ETU01 ☐ ETU01U
ACTIVITY: As attached in DIP switch setting table

SYS CONFIGURATION:

Question:

Technical Inquiry Form

MODEL No.: ☐ ETU01 ☐ ETU01U

Please fill in the DIP switches configuration with '✓' marks into the following table.

Send it to us by fax, and we will reply to you immediately.

SW NO.	DIP	FUNCTION	Your Setting		CTC Suggestion	
			ON	OFF	ON	OFF
SW1	1	Unframed/ framed				
	2	Timeslot 1				
	3	Timeslot 2				
	4	Timeslot 3				
	5	Timeslot 4				
	6	Timeslot 5				
	7	Timeslot 6				
	8	Timeslot 7				
SW2	1	Timeslot 8				
	2	Timeslot 9				
	3	Timeslot 10				
	4	Timeslot 11				
	5	Timeslot 12				
	6	Timeslot 13				
	7	Timeslot 14				
	8	Timeslot 15				
SW3	1	Timeslot 16				
	2	Timeslot 17				
	3	Timeslot 18				
	4	Timeslot 19				
	5	Timeslot 20				
	6	Timeslot 21				
	7	Timeslot 22				
	8	Timeslot 23				
SW4	1	Timeslot 24				
	2	Timeslot 25				
	3	Timeslot 26				
	4	Timeslot 27				
	5	Timeslot 28				
	6	Timeslot 29				
	7	Timeslot 30				
	8	Timeslot 31				
SW5	1	Clock Mode				
	2	Clock Mode				
	3	Clock Mode				
	4	Line Code				
	5	Frame Mode				
	6	CRC4				
	7	Idle Code				
	8	Data Port Rate				
SW6	1	Line Impedance				
	2	RC Phase				
	3	TC Phase				
	4	DCD setting				
	5	Reserved				
	6	Reserved				
	7	Data Port Loop Back				
	8	Front panel switch Enable				

Please advise any additional comments:



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